YEAR 12 CHEMISTRY - EQUILIBRIUM WORKSHEET 1

REACTION	CHANGE	OBSERVATIONS	POSITION OF EQUILIBRIUM	EXPLANATION
$H_{2(g)} + I_{2(g)} \rightleftharpoons 2 HI_{(g)}$	Remove some HI at constant			
colourless violet colourless	volume			
$Cu(H_2O)_4^{2+}(aq) + 4C\ell^{-}(aq) =$	Remove Cℓ ⁻ (aq)			
blue colourless				
$CuC\ell_4^{2^-}_{(aq)} + 4 H_2O_{(\ell)}$				
yellow				
$N_{2(g)} + 3 H_{2(g)} = 2 NH_{3(g)}$	Decrease the temperature			
all colouriess				
ΔH –ve				
$2 \text{ NO}_{2(g)} \rightleftharpoons \text{N}_2\text{O}_{4(g)} \Delta \text{H -ve}$	Raise the temperature			
brown colourless				
$2 \text{ CrO}_4^{2-}_{(aq)} + 2 \text{ H}^+_{(aq)} =$	Add OH- _(aq)			
yellow	. •			
$Cr_2O_7^{2-}(aq) + H_2O_{(\ell)}$				
Orange				

YEAR 12 CHEMISTRY - EQUILIBRIUM WORKSHEET 2

REACTION	CHANGE	OBSERVATIONS	POSITION OF EQUILIBRIUM	EXPLANATION
$2 \text{ NO}_{2(g)} \rightleftharpoons N_2O_{4(g)} \Delta H \text{ -ve}$	Reduce the volume of the			
brown colourless	container			
$N_{2(g)} + 3 H_{2(g)} \implies 2 NH_{3(g)}$	Increase the volume of the			
all colourless	container			
ΔHve				
$CaCO_{3(s)} \rightleftharpoons CaO_{(s)} + CO_{2(g)}$	Reduce the temperature			
white white colourless				
ΔH +ve				
$2 \operatorname{CrO_4^{2-}}_{(aq)} + 2 \operatorname{H^+}_{(aq)} \Longrightarrow$	Increase the concentration	****	Section 1.	
yellow	of CrO ₄ ²⁻ (aq)			
$Cr_2O_7^{2^-}_{(aq)} + H_2O_{(\ell)}$				
Orange	A dd as a IV at a santut		MANAGEMENT AND	
$H_{2(g)} + I_{2(g)} {\rightleftharpoons} 2 HI_{(g)}$ colourless violet colourless	Add more H ₂ at constant			
colouriess violet colouriess	voiume			

YEAR 12 CHEMISTRY - EQUILIBRIUM WORKSHEET 3

REACTION	CHANGE	OBSERVATIONS	POSITION OF EQUILIBRIUM	EXPLANATION
$Cu(H_2O)_4^{2+}(aq) + 4C\ell^{-}(aq) =$	Add water			
blue colourless			Property Control of the Control of t	
$CuC\ell_4^{2-}$ (aq) + 4 H ₂ O _(ℓ)				
yellow				
$H_{2(g)} + I_{2(g)} \rightleftharpoons 2 HI_{(g)}$	Reduce the volume of the			
colourless violet colourless	container			
I diameter I	Pamova I			
$I_{2(g)} = I_{2(s)}$	Remove I _{2(s)}			
violet black ΔH -ve				
ΔΓ1 -٧¢				
$I_{2(g)} {=} I_{2(s)}$	Increase the volume of the	M-1	***************************************	
violet black	container			
ΔH ~ve				
	NEEDE TO ANT CONTROL OF CONTROL CONTROL OF CONTROL CON			
I _{2(g)} = I _{2(s)}	Increase the temperature			The second secon
violet black				
ΔH -ve				

year 12 chemistry - Equilibrium worksheet 1

REACTION	CHANGE	OBSERVATIONS	POSITION OF EQUILIBRIUM	EXPLANATION
$H_{2(g)} + I_{2(g)} \rightleftharpoons 2 HI_{(g)}$ colourless violet colourless	Remove some HI at constant volume	Solution would become lighter	-	System trying to increase the HI concentration
$\begin{array}{c} \operatorname{Cu(H_2O)_4^{2+}}_{(aq)} + 4 \operatorname{C}\ell^{-}_{(aq)} & \longrightarrow \\ \text{blue} & \text{colourless} \\ \operatorname{CuC}\ell_4^{2-}_{(aq)} + 4 \operatorname{H_2O}_{(\ell)} \\ \text{yellow} \end{array}$	Remove Cℓ ⁻ (aq)	Solution would become bluer		Trying to increase the chloride ion concentration
$N_{2(g)} + 3 H_{2(g)} \rightleftharpoons 2 NH_{3(g)}$ all colourless $\Delta H - ve$	Decrease the temperature	No visual observations		Trying to increase the temperature so it would favour the exothermic reaction
2 NO _{2(g)} \Longrightarrow N ₂ O _{4(g)} ΔH -ve brown colourless	Raise the temperature	Go Darker Brown		Trying to decrease the temperature to it will favour the endothermic reaction
$2 \text{ CrO}_4^{2^-}_{(aq)} + 2 \text{ H}^+_{(aq)} \Longrightarrow$ yellow $\text{Cr}_2\text{O}_7^{2^-}_{(aq)} + \text{H}_2\text{O}_{(\ell)}$ Orange	Add OH- _(aq)	Become yellower	4	H ⁺ ion concentration will decrease due to reaction with OH ⁻ , so system will be trying to increase the H ⁺ ions

YEAR 12 CHEMISTRY - EQUILIBRIUM VORKSHEET 2

REACTION	CHANGE	OBSERVATIONS	POSITION OF EQUILIBRIUM	EXPLANATION
$2 \text{ NO}_{2(g)} \rightleftharpoons \text{N}_2\text{O}_{4(g)} \Delta \text{H}$ -ve brown colourless	Reduce the volume of the container	Colour will fade		Trying to decrease the pressure so it will favour the side with less molecules
$N_{2(g)} + 3 H_{2(g)} \Longrightarrow 2 NH_{3(g)}$ all colourless ΔH -ve	Increase the volume of the container	No visual observations		Trying to increase the pressure so favour the side with more molecules
$CaCO_{3(s)} \rightleftharpoons CaO_{(s)} + CO_{2(g)}$ white white colourless $\Delta H + ve$	Reduce the temperature	No visual observations		Trying to increase the temperature so it will favour the exothermic reaction
$2 \text{ CrO}_4^{2^-}_{(aq)} + 2 \text{ H}^+_{(aq)} $ yellow $\text{Cr}_2\text{O}_7^{2^-}_{(aq)} + \text{H}_2\text{O}_{(\ell)}$ Orange	Increase the concentration of CrO ₄ ²⁻ (aq)	From yellow to orange		Trying to decrease the chromate ion concentration so it will favout the forward reaction
$H_{2(g)} + I_{2(g)} \rightleftharpoons 2 HI_{(g)}$ colourless violet colourless	Add more H ₂ at constant volume	Colour will fade	WARRENG TO A CHICAGO AND A	Trying to decrease the hydrogen gas concentration so favour the forward reaction.

year 12 chemistry - Equilibrium vorksheet 3

REACTION	CHANGE	OBSERVATIONS	POSITION OF EQUILIBRIUM	EXPLANATION
$Cu(H_2O)_4^{2+}_{(aq)} + 4 C\ell^{(aq)} \Longrightarrow$ blue colourless $CuC\ell_4^{2-}_{(aq)} + 4 H_2O_{(\ell)}$ yellow	Add water	Become blue		
$H_{2(g)} + I_{2(g)} \rightleftharpoons 2 HI_{(g)}$ colourless violet colourless	Reduce the volume of the container	No change- depending on the volume decrease it may look a little darker	No change	No change
I _{2(g)}	Remove I _{2(s)}	No change	No change	No Change
$I_{2(g)} \rightleftharpoons I_{2(s)}$ violet black ΔH -ve	Increase the volume of the container	Become a little lighter, more purple		Trying to increase pressure so favour reverse reaction
$I_{2(g)} \rightarrow I_{2(s)}$ violet black ΔH -ve	Increase the temperature	More violet	- Annanadormacota interviorna de canada esta de can	Trying to decrease temperature to favour the endothermic reaction.

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